

Four dimensional velocity structure at the Western Nagano prefecture region using dense seismic network

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We obtained 4 dimensional (3 space dimension + 1 time dimension) seismic P and S velocity structures of crust at Nagano Prefecture, central Japan, where 1984 Western Nagano Prefecture Earthquake occurred, by means of travel time tomography. We used 164,660 P arrival times and 155,459 S travel times observed by dense seismic observation stations. There are 10,169 events and 49 observation stations. We use Pseudo-Bending Method (Um and Thurber, 1987) to calculate the ray traces and the travel times and LSQR Method (Paige and Saunders, 1982) to solve the matrix equation. The region is divided into 2km blocks. The velocity within the block is linearly interpolated by 8 values at the corners of the block. P and S wave structures, event origin times and event locations are obtained simultaneously. Station correction is not considered, because the recorder time of each observation stations is synchronized to GPS time and the height effect of the station to the travel time is accurately calculated in the ray tracing program.